

The Application of the Principle of Not to Cause Significant Harm in the Tigris and Euphrates River Basin

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Abstract

The Tigris-Euphrates basin is of high regional and global significance; however, the lack of a comprehensive multilateral agreement among riparian states has transformed the management of this transboundary watercourse into a political, security, and environmental challenge. The central issue addressed in this research is the evaluation of the quality of the application of the 'no significant harm' principle within the basin. Specifically, the study investigates whether water resource utilization—such as constructing dams beyond the natural capacity of the rivers and excessive extraction of groundwater—complies with legal obligations and the principles of equitable and reasonable utilization.

This study employs an innovative interdisciplinary approach that integrates legal and technical analyses. The legal framework is established by examining customary sources, international conventions, and the insights of prominent international law scholars regarding the definition and scope of "no significant harm." Concurrently, up-to-date technical data on dam capacities, river flow alterations, and groundwater extraction—sourced from reputable publications—serve as the empirical basis for assessing the practical application of the principle.

The findings indicate that mismanagement practices in water resource development can inflict significant harm on the ecosystem, regional wetlands, and the livelihoods of local communities. Therefore, the formulation of a comprehensive framework and the advancement of multilateral cooperation for the equitable and reasonable use of the Tigris-Euphrates resources is imperative.

Keywords: International Water Law, International Watercourse Law, Tigris and Euphrates River Basin, Transboundary Watercourses, Not to Cause Significant Harm, International Wetlands.

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1. Introduction

“Watercourse” means a system of surface waters and groundwater constituting a unitary whole by virtue of their physical relationship and normally flowing into a common terminus (McCaffrey,2019:106). Therefore, the basin of a watercourse is a general and indivisible area whose location in the sovereignty of several states does not affect its natural characteristics and uniqueness (Momtaz,1995:109-112). In this study, the Tigris-Euphrates River basin, along with international watercourses, underground waters, water transfer canals, and wetlands located in the area of these two rivers, are being addressed.

The Tigris-Euphrates basin faces significant threats from riparian countries due to increasing population pressure, unilateral development projects, and geopolitical tensions. The region's population, currently around 50.69 million, is projected to surpass 200 million by 2050, intensifying demands for water, food, and energy (Al-Ansari,2019:44-48; United Nations Economic and Social Commission for Western Asia & Federal Institute for Geosciences and Natural Resources,2013:19). This has led to large-scale infrastructure projects, particularly upstream, where Turkey's ambitious GAP project has altered the basin's hydrological balance, impacting downstream nations (Bachmann et al.,2019:13). While Turkey justifies these projects on economic grounds (Warner,2012:243), Iraq and Syria perceive them as political maneuvers, accusing Turkey of weaponizing water and threatening their national security (Korkutan,2001:19; Naff,1984:115-119; Zaki et al.,2023: 263-265). Meanwhile, Iraq and Syria have also expanded their own water infrastructure, further straining regional water resources (Kibaroglu et al., 2005:58-59). In addition to political disputes, the basin faces severe environmental degradation, including wetland drainage (Kirschner & Tiroch, 2012:349) and worsening dust storms, particularly affecting Iran's southern and western regions (Bijnens,2021:119-122; Hafeznia et al.,2016:27-28). These combined pressures—rapid population growth, unilateral water management, and regional conflicts—have exacerbated the water crisis in the basin, making cooperation increasingly difficult amid a changing climate (Kibaroglu & Maden,2014:347).

The management of transboundary water resources in the basin remains a contentious issue, with competing claims and geopolitical tensions shaping water governance among riparian states. At the core of international water law is the principle of no significant harm, a key tenet of the 1997 UN

Convention on the Law of Non-Navigational Uses of International Watercourses (hereinafter referred to as the UN Watercourses Convention), which seeks to prevent states from causing substantial damage to co-riparian states. While scholars such as (Dellapenna,1996:247-250; Lupu,2001:363) have examined the balance between no significant harm and equitable utilization in transboundary water management, their discussions often remain theoretical, without a focused analysis of how these principles operate in the complex political and environmental realities of the Tigris-Euphrates. Despite its recognition in international law, the no significant harm principle faces significant challenges in its implementation, particularly in regions with asymmetric power dynamics (Sindico,2021:178-182) and (Burleson,2005:4). have highlighted the difficulties in enforcing this principle, especially in the absence of a binding regional agreement. However, their analyses largely address legal frameworks rather than providing an in-depth examination of state practices in the Tigris-Euphrates context (Navari,2019:234-238) and (Zare and Ramazani Ghavam Abadi,2021:207-209) go further, arguing that Turkey's disregard for this principle, particularly in its unilateral dam construction projects, could constitute a violation of international environmental obligations. Yet, their assessments focus more on the legal implications rather than the practical mechanisms—or lack thereof—through which affected downstream states such as Iran, Iraq and Syria could challenge such actions.

More recent studies have attempted to bridge this gap by examining the direct consequences of Turkey's extensive dam projects (Khalil,2023:154). analyzes the impacts of the Ilisu Dam on Iraq and Syria, particularly in terms of water flow reduction and agricultural decline, but the study stops short of situating these impacts within broader debates on state responsibility under international law (Asaad,2024:379-380). explores the conflicting interpretations of no significant harm among the basin states, with Iraq and Syria rejecting Turkey's "one basin" approach in favor of distinct river basin management. However, this work does not systematically analyze how the principle is enforced—or circumvented—in practice. Similarly (Trmash and Others,2024:28-32), offer a critical assessment of Turkey's actions, arguing that its large-scale water diversion projects directly violate no significant harm. Yet, their study remains largely theoretical, emphasizing legal arguments over practical enforcement mechanisms.

While these works contribute valuable insights into the legal and geopolitical dimensions of the Tigris-Euphrates water dispute, they collectively reveal a critical gap in the literature: a lack of detailed, case-specific analysis of how the no significant harm principle is operationalized in the basin. Existing scholarship predominantly addresses either the theoretical underpinnings of international water law or the broad consequences of unilateral water management practices without thoroughly examining the mechanisms through which this principle is enforced—or undermined—in practice. This study aims to fill that gap by critically assessing the extent to which no significant harm has influenced water governance in the Tigris-Euphrates basin, considering both legal frameworks and the geopolitical realities that shape state behavior. Doing so will provide a nuanced understanding of the limitations and potential pathways for strengthening transboundary water cooperation in one of the world's most water-stressed regions.

By integrating these extensive technical insights with legal analysis, this study aims to critically assess the extent to which the no significant harm principle is being implemented in the Tigris-Euphrates basin, thereby informing more effective transboundary water governance strategies.

2.Methodology

This research adopts a mixed-methods approach that integrates both qualitative and quantitative analyses to evaluate the applicability of the "no significant harm" principle in the Tigris-Euphrates basin.

In the qualitative phase, the study examines the conceptual and legal foundations of the no significant harm principle in international water law by reviewing relevant legal instruments, customary practices, and international conventions. This analysis focuses on understanding how the principle is defined, interpreted, and applied within the context of transboundary water governance.

In the quantitative phase, the study utilizes updated technical data on dam capacities, per capita water availability, river flow statistics, and other related indicators. These data are primarily derived from the technical section of a research project conducted in the Tigris-Euphrates basin and have been updated to reflect the latest available information from reputable sources such as (United Nations Economic and Social Commission for Western Asia and Federal Institute for Geosciences and Natural Resources,2013; Altinbilek, 2004; Mianabadi & Amini,2019). Additionally, a comparative method is

employed among the riparian countries to assess disparities in water resource allocation and the impacts of dam development.

This multi-faceted approach—combining in-depth legal analysis with robust, up-to-date quantitative data—provides a comprehensive framework for analyzing the complex technical, environmental, and geopolitical challenges of the Tigris-Euphrates basin. Ultimately, this methodology supports the development of evidence-based recommendations for sustainable transboundary water management and the effective enforcement of the no significant harm principle.

3. Hydro-Environmental Foundations and Challenges in Applying the No Significant Harm Principle in the Tigris-Euphrates River Basin

The Tigris-Euphrates basin (Figure 1), being situated in the territory of six Middle Eastern countries and under urgent demand of the region's population for water and lack of cooperation among these riparian states for achieving the goal of optimum and sustainable utilization, has created political and security issues.

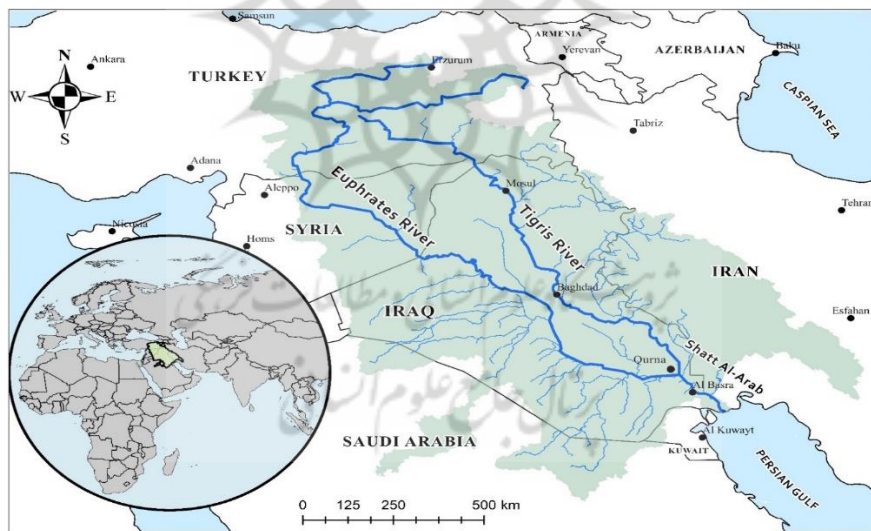


Figure (1): The Tigris-Euphrates Ddrainage Basin
(Source: Montazeri et al.,2023:2)

Construction of dams and structures in the Tigris-Euphrates River basin by riparian states can be studied from two perspectives: first, due to the natural condition of the basin and states' demand for dam construction to this extent

and according to the capacity of dams and structures, are such utilizations equitable and reasonable? Second, whether the principle of dam construction and their capacity are equitable and reasonable, have such actions violated the principle of no significant harm to other states? To answer such questions, it is necessary to investigate the general features of the Tigris-Euphrates River basin in the first place, then scrutinize per capita annual water allocation by Iraq, Syria and Turkey and finally study the number and capacity of dams and structures and socio-economic situation of the basin. Accordingly, relevant data are presented below.

Table (1): General Features of the Basin

	Tigris	Euphrates
Basin Countries	Iran, Iraq, Syria, and Turkey	Iraq, Jordan, Saudi Arabia, Syria, and Turkey
Area of Countries in the Basin	Iran: 19%, Iraq: 56%, Syria: 0/5%, and Turkey: 24.5%	Iraq: 47%, Jordan: 0/3%, Saudi Arabia: 2/97%, Syria: 22%, and Turkey: 28%
Area of the Basin	221,000 km ²	440,000 km ²
Length of the River	1,800 km	2,786 km
Average Annual Volume of the Flow in the Border of Turkey and Iraq	47 BCM (at Kut)	Before Damming (1930-1973): ~30 BCM After Damming (1974-2010): ~25 BCM
Important dams	14 (max. Storage Capacity 116.5 BCM)	>60 (max. Storage Capacity 144 BCM)
Area of Lands under Irrigation Outside of the Basin	150 ha	-
Area of Lands under Irrigation Inside the Basin	4.7 Million ha	5.4 Million ha
Population of the Basin	27.36 Million	23.4 Million

(Source: United Nations Economic and Social Commission for Western Asia & Federal Institute for Geosciences and Natural Resources, 2013:49 & 101)

Table (2): Average Annual Water Availability Per Capita in Iraq, Syria, and Turkey

	1990	2000	2010	2020
Iraq	2352	1848	1435	1062
Syria	1636	1177	880	760
Turkey	3223	2703	2326	2002

(Source: Altinbilek, 2004:28; Al-Ansari et al., 2023:473)

Table (3): Capacity of Constructed and Constructing Structures of Riparian States on the Tigris-Euphrates Basin (Billion Cubic Meters)

River		Iraq	Syria		Turkey		Total	Percentage of the Total Average Flow
	Storage Capacity	Total Catchment Percentage	Storage Capacity	Total Catchment Percentage	Storage Capacity	Total Catchment Percentage		
Tigris	130 %	260 %	1/5 %	3 %	17/6 %	35 %	149 %	Threefold
Euphrates	37/6 %	125%	17/7 %	59 %	98 %	32/5 %	153 %	Fivefold
Total	167/6 %	210 %	19/2 %	25 %	115/6 %	145 %	302 %	3.8-fold

(Source: Mianabadi & Amini,2019:59)

Table (1) presents the general features of the Tigris-Euphrates River basins, highlighting the basin's geographic distribution and hydrological characteristics. Moreover, Table (2) illustrates the variations in annual per capita water availability among Iraq, Syria and Turkey. In contrast, Table (3) quantifies the capacity of dams and structures, revealing that the cumulative storage capacity in the basin is approximately 2.6 times the total water resources. These figures underscore the critical state of water resource overexploitation and also set the stage for analyzing how such disparities impact the practical application of the no significant harm principle. The capacity of these structures on the Tigris is approximately 5 times that amount. On the other hand, whereas nearly 89 per cent of the Euphrates flows from Turkey, this country can reserve more than three times the total catchment of this river behind its dams. Additionally, the storage capacity of structures and dams of Turkey on the Tigris River is 17.6 billion cubic meters. In comparison, the Tigris River's average annual flow near Iraq and Turkey's border is approximately 16.8 billion cubic meters (Bagis,1997:568-571). This indicates that Turkey can store all the water resources from the Tigris River in this country. Furthermore, the total capacity of dams and structures built in Turkey on the Tigris-Euphrates River basin is 1.55 times greater than the total water resources of this basin, while this statistic for Iraq is 0.88. The total capacity of structures built on the Tigris-Euphrates basin is, on average, 217 billion cubic meters, which is about 2.6 times greater than the total water resources in this basin. Among these, Iran has allocated 1.8% for its operational dams, Iraq 22.9%, Syria 8.6%, and Turkey 66.5%. Additionally, Iran has allocated 0.4% of planned dams, Iraq 70.5%, and Turkey 29% (Mianabadi & Amini,2019:59-60).

One of the other issues in the Tigris-Euphrates basin is the extraction of underground waters from common underground aquifer systems (Fienen &

Arshad,2016:40), such as Ceylanpınar and Ras-al-Ain Karst springs by Turkey and Syria, located in the southeastern part of Turkey and North of Syria; the Khabur River, as a branch of the Euphrates, is recharged from these two aquifers (Zaitchik et al.,2002:4). Extraction of underground waters decreased the discharge flow from the spring to the Khabur River, and sometimes, in drought times like the year 2000, this amount fell to zero (Mundial,2001:3). Thus, the utilization of underground waters by these two countries for irrigation and digging many wells, whose unofficial number is more than the official one, has affected the discharge of the Euphrates (Kibaroglu et al.,2005:73).

Mesopotamian marshes, with an area of over 9000 km² are comprised of three main wetlands of central marshes, Hammar marsh, and Hawzieh. Central marshes, Hammar marsh, and two-thirds of Hawzieh are in Iraq territory, and one-third of the subsequent marsh is in Iran (Al-Nasrawi et al.,2021:94). Implementing the GAP project in Turkey and dam construction plans in Iraq and Syria have resulted in water shortages in Mesopotamian marshes (Hamidi,2020:8; Adriansen,2004:4-6) has been denounced as being harmful to Kurds and their villages (Hipel et al.,2015:358-360). The former Iraqi government prevented the water flow of the Tigris-Euphrates basin into these three wetlands for conversion of these ecosystems into agricultural lands and directed water flow to arable lands by building massive canals and diversion of water flow in the delta area of these rivers and before reaching to these wetlands (Adamo et al.,2020:56-62). To implement these plans, political and military purposes and repression of Shia resident people around these wetlands have been followed by the former Iraqi regime (Partow,2001:22-29). These measures led to the drainage of 94 per cent of Hammar Marsh, 97 per cent of central marshes and 70 per cent of Hawzieh. Moreover, the water quality of the Shatt al-Arab River decreased due to increased agricultural drainage of the Tigris and particularly the Euphrates irrigation network (Al-Ansari et al.,2018:104).

Also, as a result of a decrease in water quantity of Shatt al-Arab from dam constructions in upstream states and the increase in depth of intrusion of saline water into the Shatt al-Arab, most palm trees and marginal lands surrounding Shatt al-Arab have been dried out (Kirschner & Tiroch,2012: 393). As the UN report indicates, the reasons for the water quality degradation of Shatt al-Arab have been the entry of agricultural drains of Iraq, Syria, and Turkey and decreased river water and storage of such water in constructed

dam reservoirs by these three countries (United Nations Economic and Social Commission for Western Asia & Federal Institute for Geosciences and Natural Resources, 2013:67-68). These countries have been introduced as being involved in making such a situation. Additionally, due to the construction of various dams upstream in those three countries and the water decline in Shatt al-Arab (Al-Asadi & Muttashar, 2022:84-86), morphological changes have occurred. Subsequently, the Talweg line has been shifted, and the costs of maintaining this line have risen (Adamo et al., 2020:56-57).

The technical data provided above illustrate not only the extent of infrastructural development in the basin but also the inherent imbalances in resource allocation among riparian states. These imbalances have direct implications for the enforcement of international water law, particularly the no significant harm principle. When one state develops extensive infrastructure, it can significantly alter the flow and availability of water for other states, leading to reduced water quality and quantity downstream. This can exacerbate economic disparities, as states with more resources can monopolize water resources, making it difficult for the less developed states to access their fair share. Additionally, large-scale infrastructure projects can disrupt natural watercourses, affecting ecosystems and harming states that rely on them. These imbalances can lead to legal and diplomatic tensions, highlighting the urgency for a coordinated management approach that integrates both technical solutions and legal frameworks to ensure sustainable and fair use of shared water resources.

4.No Significant Harm Principle

This section will initially examine the no significant harm principle concept and its relevance to the Tigris-Euphrates basin.

4-1. Concept of No Significant Harm Principle in the Tigris-Euphrates Basin

The second fundamental pillar in international water law is the state's obligation not to cause significant harm to other countries. Commitment to such an obligation originated from the theory of limited territorial sovereignty (McIntyre, 2017:59-61). According to this principle, no watercourse State has the right to use its territory in such manner as to cause injury to other watercourse States or their environment, including harm to human health or safety for beneficial purposes or take an action that is harmful for living organisms in the watercourse (French, 2017:160 & 172-174).

In other words, utilizing an international watercourse by a State should not lead to greater damage for another State. Quantity and importance of inflicted harm are the main criteria for recognizing equitable utilization of a watercourse. Harm can be resulted from a reduction in water quantity or pollution arising from other activities and this necessarily does not concern the direct utilization of water flow by countries. For example, deforestation could indirectly lead to pollution or a decrease in water quantity (Kirschner & Tiroch,2012:357).

To ascertain the application of no significant harm obligation by neighboring countries, on one hand, the performance of the State of origin must be addressed, and on the other hand, it should be noted whether such State has adopted necessary regulations to abstain from inflicting harm to neighboring countries (McCaffrey,2019:541). Also, it is of great need to consider the standards of the State of origin. States must take reasonable measures that cause no significant harm. However, such actions should be evaluated considering special events, circumstances, and potentials of the State of origin. To be clear, the criteria for assessment is typical-personal i.e. conduct of a reasonable individual in a special situation (Rieu-Clarke et al.,2012:119). Commitment of States to no significant harm to other States is naturally an obligation of conduct (McIntyre,2020:603-604). The co-riparian States are obligated to take all “appropriate measures” to ensure that planned activities in their territory would not cause any significant harm to other States’ jurisdiction (Rieu-Clarke et al.,2012:119). In assessing all appropriate measures, the importance of a subject and the dignity and strength of the power exercising it are assessed. they should follow the same precautionary measures as these States take in their own domestic territory (Payne,2011:97-101). For instance, States should give early notification and transfer information concerning every planned activity that may harm other watercourse states in a significant way (Patel,2014:549). Establishing necessary regulations, enforcing domestic laws, preventing illegal activities and punishing the person responsible are among the measures that a reasonable government would expect (Rieu-Clarke et al.,2012:119). Moreover, taking actions such as devoting water rights, conserving water quality for human and ecosystem uses, establishing a participatory water management structure and making a coherent legal system at local, national, and international levels, creating necessary institutional mechanisms for the enforcement of laws are of requisites for committing to no significant harm

obligation (Iza & Stein,2009:44-72). Accordingly, it is being seen that in realizing the obligation of conduct, a typical and personal criterion must be performed, i.e., a riparian State as a reasonable State should take precautionary actions considering capabilities and circumstances particular to the case.

Under general rules of liability, the affected state should first prove the damage to itself, then prove that the harm is significant; after that, it must show that the due diligence, which has been supposed to be taken by a reasonable state, was not preserved by the state of origin, next it has to establish that there is a causality relationship between the absence of diligence of the latter and significant harm. In this case, the state of origin will be obligated to pay damages unless it proves that, with regard to its capabilities and particular circumstances, it couldn't prevent such harm. In other words, although in obligation of conduct and obligation of omission, the burden of proof is on the injured party, in the current discussion, the instances of obligation to comply with no significant harm are among positive actions and burden of proof to take due diligence for being excluded from liability is on the State of origin. In fact, the mere significant harm is considered an imposition of “*res ipsa loquitur*”¹ on the State of origin, and to prove this wrong is on its own shoulder (McCaffrey,2019:547-549).

According to general principles of liability, the mere significant harm, whether slight or serious, is the reason for the realization of liability (McIntyre,2018:352-355). However, there is a special statement considering harm arising from using international watercourses expressing that harm should be significant and serious until liability is established (Rieu-Clarke, 2020:669). The rationale for introducing exceptions to the general rules of responsibility lies in the fact that downstream states, invoking the no-harm rule, have argued that any harm resulting from the upstream states' development projects entails the latter's liability. In contrast, upstream States had recourse to the equitable and reasonable utilization principle, stating that since utilization is equitable and reasonable and causes harm to downstream states, it is not considered a faulty, harmful action that could lead to liability (Salman,2007:633). To solve this contradiction between these two rules, the 1997 UN Watercourse Convention made an effort not to recognize as responsible the State that utilized the watercourse equitably and reasonably (Wouters et al.,2005:18). However, when there is significant harm to other

1.Presumption of Guilt.

riparian States, the burden of proof for utilization being equitable and reasonable is on the State whose utilization caused harm to others (International Law Commission,1994:104). In the contradiction between these two rules, the equitable and reasonable utilization principle is preferable over the no-harm rule unless, in case of significant harm, the State of origin could not prove its utilization as not being equitable and reasonable (McCaffrey,2019:531-532).

Under Article 7 of the 1997 Convention, harm should be significant (International Law Commission,1997:5). What is significant, and how can it be distinguished? It has been told that what can be considered as significant harm should be more than a mere harmful impact, namely disturbing the environment or socio-economic development of the injured State like public health, industry, properties, and agriculture (Rieu-Clarke et al.,2012:120). Significant harm should be evaluated, determined separately, and proved by objective evidence (Rieu-Clarke et al.,2012:120). By the way, significant harm is obviously a substantive and subjective issue and should be objectively assessed in every individual case. In the context of the Tigris-Euphrates basin, proving "no significant harm" through objective evidence presents challenges due to the complexity of hydrological assessments, lack of transparent data sharing among riparian states (Hasan et al.,2023:783), and differing interpretations of what constitutes "significant harm."

Evaluating and determining significant harm in the Tigris-Euphrates basin requires a structured approach based on international legal standards, scientific evidence, and diplomatic mechanisms. Given the historical and ongoing disputes over water allocation among basin states, assessing significant harm should be done separately for each country and impact category while relying on objective evidence such as hydrological data, environmental studies, and economic assessments.

5.Sources of the No Significant Harm Principle

This section explores the sources of the no significant harm principle, examining its foundation in customary international law, international conventions, and judicial interpretations and assessing its application in transboundary water governance.

5-1.International Custom as Evidence of a General Practice Accepted as a Law

The no significant harm principle has been recognized as one of the important customary and conventional principles of international law, including international environmental law (Tignino and Bréthaut,2020:633).

International instruments, including The Convention on the Law of Non-Navigational Uses of International Watercourses, Helsinki Rules on the Uses of the Waters of International Rivers, the Berlin Rules on Water Resources, and draft articles on Aquifers endorse this principle as an international customary rule.

Under article 7.2 of the 1997 Convention, “Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation (International Law Commission,1997:5).

Berlin Rules have expressed two principles of equitable and reasonable utilization and no significant harm and put an emphasis on the latter (Salman, 2007:635-638), besides not only taking the quantitative aspects of water but also its qualitative aspects into consideration (Avarideh et al.,2016:94). Under Article 12 and when expressing the concept of equitable utilization, these rules considered no significant harm and paid greater attention to the minimization of environmental harm when listing relevant factors to equitable and reasonable utilization (International Law Association,2004: 21). Under Article 16 of Berlin rules, while stressing the need to prevent transboundary harm, it provided that basin States, in managing the waters of an international drainage basin, shall refrain from and prevent acts or omissions within their territory that cause significant harm to another basin State having due diligence for the right of each basin State to make equitable and reasonable use of the waters (International Law Association,2004:16).

Article 6 of the draft articles on aquifers established that

“1) Aquifer states shall, in utilizing transboundary aquifers or aquifer systems in their territories, take all appropriate measures to prevent the causing of significant harm to other aquifer States or other States in whose territory a discharge zone is located,

2) Aquifer states shall, in undertaking activities other than utilization of a transboundary aquifer or aquifer system that have, or are likely to have, an impact on that transboundary aquifer or aquifer system, take all appropriate measures to prevent the causing of significant harm through that aquifer or aquifer system to other aquifer States or other States in whose territory a discharge zone is located,

and 3) Where significant harm nevertheless is caused to another aquifer State or a State in whose territory a discharge zone is located, the aquifer States whose activities cause such harm shall take, in consultation with the affected State, all appropriate response measures to eliminate or mitigate such harm, having due regard for the provisions of draft articles 4 and 5 (International Law Commission, 2008:5).”

The principle of no significant harm has been accepted in state practice and international judicial opinions. Germany wrote to its secretary minister in London and Paris in 1862 about the Meuse River: it is shared between the Netherlands and Belgium, and each of these States is entitled to use its water. However, both are committed to avoiding measures causing harm to the other (Garretson et al., 1967:25).

Also, the US Supreme Court declared in the case of *Wyoming v. Colorado* in 1922 that Colorado’s allegation, based on which it has the right to divert water streams flowing into its territory and utilizes them by its own discretion and regardless of damage upon others as a result of its actions, is not admissible (McCaffrey, 2019:145). This writ was cited in the case of *Connecticut v. Massachusetts* in 1930 and some other cases and it has been accepted as a rule of international law (McCaffrey, 2019:331).

The issue of diverting rivers’ water was addressed in the *Donauversinkung Case* in 1927 (Herdegen, 1987:137). The court held that “No State may substantially impair the natural use of the flow of such a river by its neighbor. This principle has gained increased recognition in international relations (Herdegen, 1987:138).”

In international judicial practice, the arbitration tribunal stated, in the *Trail Smelter case* in 1941 between the US v. Canada, that under principles of international law, “no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein when the case is of serious consequence, and the injury is established by clear and convincing evidence (*United States v. Canada*, 1941:1965).” Moreover, in 1949, in the *Corfu Channel case* between Great Britain v. Albania, ICJ confirmed “... every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other State (Wright, 1949:492).”

ICJ also confirmed, in its ruling on the *Gabčíkovo-Nagymaros case*, some basic principles of international water law i.e., equality of all riparian States (whether downstream or upstream) in the utilization of shared watercourses

as well as non-recognition of unilateral acts by a State resulting in deprivation of other riparian States from the right to an equitable and reasonable share of relevant watercourse. Therefore, the court established that equitable and reasonable utilization is a leading principle of international water law and is, in fact, connected with the obligation of no significant harm (International Court of Justice,1997:56).

In the case of *Nicaragua v. Costa Rica*, ICJ dealt with Nicaragua's claim that Costa Rica's action on constructing a road and making sediments in the San Juan River is a violation of no significant transboundary harm to this State (International Court of Justice,2015:61). The court, after hearing evidence from both States and considering technical and expert points, concluded that "Nicaragua's submission that any detrimental impact on the river that is susceptible of being measured constitutes significant harm is unfounded (International Court of Justice,2015:69)."

Hence, ICJ joining the proceedings and investigating the substantive issues indicate that the court considered the obligation of no significant transboundary harm as customary rules of international law since one of Nicaragua's pieces of evidence to express such claim was that Costa Rica was obliged to no significant transboundary harm under customary international law.

Of the 4 basin countries, Iraq and Syria have ratified the 1997 Watercourse Convention shortly after it was approved (Forsythe,2017:169), and Iraq just recently ratified the 1992 Water Convention (United Nations Iraq,2023). Turkey has not only refrained from ratifying the agreement but also voted against its approval during the diplomatic conference that opened it for signature (Kibaroglu,2019:16). However, it should be noted that in a position paper on the utilization of Euphrates and Tigris, the Turkish Ministry of Foreign Affairs stated that the obligation not to cause significant harm and the doctrine of equitable and reasonable utilization are established as international customary law. Still, the ministry does not explicitly state that these apply to Tigris-Euphrates. Yet, since the Ministry mentions both provisions in a position paper on the utilization of the Tigris-Euphrates basin, it is likely that the Ministry considers them to be binding for the utilization of the Tigris-Euphrates basin (Bremer,2013:17). Iran is not a party to the 1997 UN Watercourses Convention or any other non-navigational international watercourse convention (Abdulrahman,2018:30). Although Iran originally supported the Convention (Loures and Others, 2009: 26), it has not followed

with ratification nor commented on it (Zeitoun,2015:960). Iran's position towards the convention has been cautious and influenced by various political, legal, and regional factors, such as concerns about national sovereignty and how the convention might impact its control over shared water resources.

Albeit, the ripples triggered by international law in practice may leave space for a clearer reflection of international law in the waters of rivers, lakes, and aquifers through the application of customary international law. If the latter fully embraces the equitable and reasonable utilization principle and the no-harm rule, the tension between sovereignty and transboundary cooperation should be manageable in the field of transboundary waters (Sindico,2021: 182). Even though the convention is an important source of international water law, there is an evolving set of customary international water law that defines rights and obligations concerning transboundary water cooperation. Hence, basin riparian states must comply with the existing rules of customary international water law regardless of whether they are party to the UN Watercourses Convention (Kibaroglu,2019:16-17).

5-2.International Conventions, whether General or Specific

Riparian states of the Tigris-Euphrates basin are parties to several international conventions that shape their obligations regarding water management and environmental protection. These agreements, whether general or specific, establish frameworks for cooperation, conservation, and the principle of no significant harm. Notable among them are the Ramsar Convention on Wetlands, the Convention on Biological Diversity (CBD), the Convention on Migratory Species (CMS), and the UNESCO Convention on Natural and Cultural World Heritage. Each of these instruments reinforces the responsibility of states to manage shared water resources while minimizing transboundary environmental harm sustainably. Understanding their scope and relevance is crucial for assessing regional water governance and conflict resolution.

The no significant harm principle is not addressed in the text of the Ramsar Convention, although one of the principles to reach the ultimate goal of wise use is no significant harm. In most COP's guidelines, this principle generally and dam construction, in particular, have been referred to. One of COP's guidelines in the 7th meeting of the parties in San Jose, 1999, is the minimization of impacts resulting from the development of water plans (Ramsar CoP,1999c:8). "Water resource development projects are generally aimed at modifying the natural water flows in a basin for purposes such as

storing water through drought periods, preventing floods, transferring water to irrigated agricultural areas, industrial and domestic water supply, improving navigation and generating electricity. Such projects have frequently been developed by constructing engineered structures such as dams, diversion canals, channelizing rivers, flood levees, etc. Many such projects, by modifying the natural conditions that have allowed wetlands to develop, have had a significant negative impact on wetlands and associated biodiversity (Ramsar CoP,1999a:13).” Hence, to the maintenance of natural water regimes to maintenance of wetlands, parties are called upon to “Regulate and monitor the impacts of major infrastructure developments (levees, embankments, roadways, weirs, small dams and cuttings) undertaken within river and flood corridors (Ramsar CoP,1999a:15).”

Also, in the 8th meeting of COP in Valencia in 2002, parties adopted resolution VIII.2. They recognized that “large dams around the world affect wetland hydrology, influencing both water quality and quantity (Ramsar CoP, 1999b:1).¹” This resolution was adopted by consensus of all parties, but Turkey opposed the World Dam Commission report and unanimously approved the resolution. Turkey stated that the report of the World Dam Commission (WDC) should not be considered as a reference for the implementation of the Ramsar Convention since this report is not acceptable as a universal document, and many countries criticized it (Iza,2004:44).

One of the implications of development plans like dam construction projects is disasters as a result of which may occur in countries. The 12th COP adopted a resolution on “wetlands and disaster risk reduction” of development plans. According to this resolution, parties are encouraged “to assess disaster risk to wetland ecosystems at the appropriate social and spatial scale to enable the designing of effective disaster risk reduction interventions including ecosystem-based solutions and approaches to reduce the vulnerability and exposure of people and ecosystems (Ramsar CoP,2015:3).” Also, parties are motivated to “ensure that necessary development activities in and adjacent to wetlands are sustainable and will maintain and conserve ecosystem services including the role of wetlands in reducing impacts of disasters (Ramsar CoP, 2015:3).”

The sovereign right of the State to exploit its own resources located in its territory is the second principle in the Rio Declaration (United Nations, 1992b) is vividly expressed in the Convention on Biological Diversity (CBD),

1.Turkey expressed a reservation during the adoption by consensus of this Resolution.

to which all riparian States are party. Nevertheless, article 3 of CBD provided that states have “the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction (United Nations, 1992a).”

Article 3 of CBD places a positive obligation on its parties to ensure that their activities do not cause any damage to the environment of other States. Moreover, article 4 provided that this obligation applies to “processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction (United Nations, 1992a).” Article 14, paragraph 2 of CBD, provides that redress measures should include restoration and compensation (UNEP/CBD/WS-L&R/2, 2001:2). Monetary compensation is not the only way to redress environmental harm and under some circumstances like degradation of biological diversity, compensation can include environmental restoration or criminal sanction (Cullet, 2004:177-178).

Additionally, another treaty to which all riparian States of the Tigris-Euphrates have joined is the Convention of Migratory Species of Wild Animals (CMS) (CMS, 1979). “The Parties acknowledge the need to take action to avoid any migratory species becoming endangered.” This principle is of great importance in the context of the conservation of biodiversity since some birds, especially migratory species of freshwater, have suffered serious damage due to the construction of large dams (McAllister et al., 2001:23-24). UNESCO Convention on Natural and Cultural World Heritage (1972) is another legal instrument to which all riparian States of the Tigris-Euphrates joined (UNESCO, 2024). Although this convention is void of legally binding obligations, it can be discussed as an internationally legal instrument. It has been stated in the preamble of the convention “that deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all the nations of the world (Francioni & Lenzerini, 2023:24-25).” This issue itself is marked by the interconnectedness of the international community and the natural environment of human livelihood, whose change in one part of it will have significant impacts on all nations.

One of the commitments referred to in the convention is article 6.1, under which all States are requested to cooperate while they fully respect the

sovereignty of others to protect natural and cultural heritage situated in the territory of each Member State. Besides, under article 6.3, they “undertake not to take any deliberate measures which might damage directly or indirectly the cultural and natural heritage... situated on the territory of other States Parties to this Convention (Lixinski & Tzevelekos,2020:3).”

6.Assessing the Quality of Applying No Significant Harm in the Tigris-Euphrates

In assessing the application of the no significant harm principle in the Tigris-Euphrates basin, it is crucial to consider the extensive construction projects (Figure 2) undertaken by Iraq, Syria, and Turkey. By 2020, these projects resulted in a total storage capacity of 174 km³—more than twice the basin's annual renewable water supply of 81 km³ (Mianabadi & Amini,2019:59-62; Montazeri et al.,2023:2). The competition over shared water resources has led to the construction of over 140 dams in this watershed (Montazeri et al., 2023:2). However, the storage capacity is unevenly distributed: Turkey controls 66% of the operational capacity, while Iran, Iraq, and Syria hold 2.4%, 23%, and 8.6%, respectively. This disparity is further reflected in per capita water availability, with figures of 1,699 m³/year for Iran, 2,393 m³/year for Iraq, 983 m³/year for Syria, and 2,609 m³/year for Turkey (Mueller et al.,2021:13).

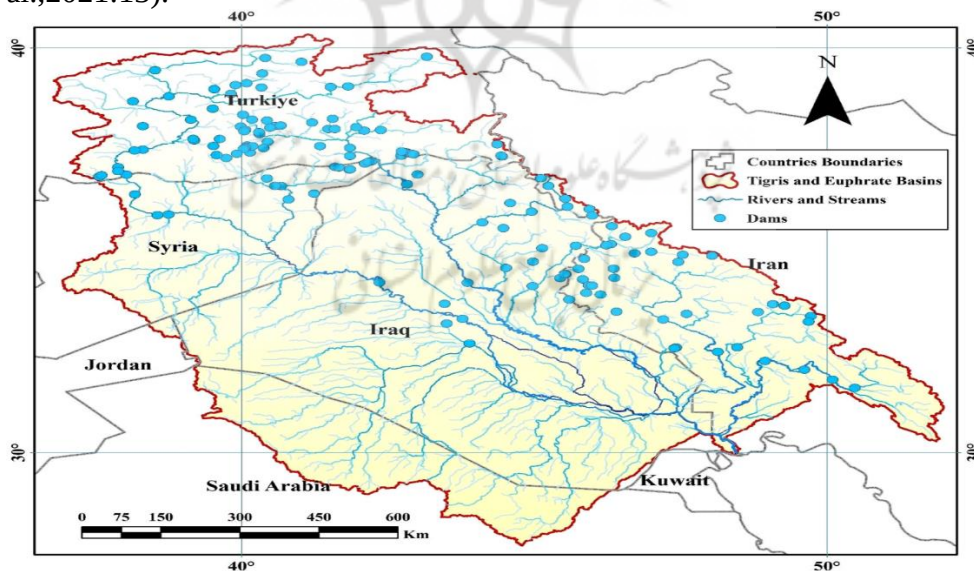


Figure (2): Tigris-Euphrates River Basin and the Dams in the Basin
(Source: Hasan et al.,2023:782)

Recent upstream developments have significantly altered water flow and quality, leading to reduced water supply downstream (Akanda et al.,2007:2-3; Carkoglu & Eder,2001:41; Haghighi et al.,2020:963). Moreover, unsustainable human use of natural resources has exacerbated the effects of drought in the region (Azizi & Leandro,2025:13). These changes pose risks not only to the interests of downstream countries but also to regional ecosystems and wetlands. Additionally, the unauthorized utilization of underground resources, particularly by Syria and Turkey, negatively impacts the discharge volume of these two rivers, further endangering the ecosystem and wetlands (Kangarani,2006:17-18 & 28-29). Moreover, Iraq's construction of various water canals has diverted river flow toward agricultural lands, preventing water from reaching the Mesopotamian marshes (Moumin,2007:508). This diversion has contributed to the drainage of these wetlands, which are a primary source of dust storms affecting large parts of Iran and Iraq (Beyranvand et al.,2023:14).

In transboundary watercourses like the Tigris-Euphrates, significant harm refers to measurable and adverse effects on the environment, economy, or human populations of a downstream or co-riparian state arising from the actions of an upstream state (Mianabadi et al,2021:12-13). The environmental dimension of harm in this basin is profound. The damming and diversion of water for irrigation and hydroelectric projects have led to reduced flow and degradation of aquatic ecosystems (Abdullah et al.,2015:215-216). This has resulted in rising salinity levels and the depletion of wetlands (Al-Yamani et al.,2007:284), which play vital roles in local biodiversity. Additionally, the reduction of river discharge has directly contributed to desertification and worsening dust storms that significantly impact air quality and public health in the region (Bolorani et al.,2024:2).

Hydrological and technical considerations further compound the issue. The construction of large dams, such as Turkey's Ilisu Dam, alters the natural flow of the rivers, causing downstream effects like reduced water availability for Iraq and Syria and exacerbating drought conditions (Thaman,2021:25-26). Changes in sediment transport have also disrupted natural river functions, leading to riverbed degradation and increased erosion in downstream areas (Al-Ansari et al.,2018:109; Ayboga,2019:3). Furthermore, the extensive use of underground water resources, particularly in Syria and Turkey, has altered the groundwater balance, reducing base flow contributions to the rivers (Daoudy et al.,2024:10 & 33-35). These hydrological changes not only affect

water quantity but also degrade water quality, increasing pollution concentrations and negatively impacting agriculture and drinking water supplies (Al-Ansari et al.,2018:113-114; Zebardast et al.,2023:1486-1487).

The socio-economic consequences of unilateral upstream water development in the Tigris-Euphrates basin are severe. The reduction in water flow has led to declining agricultural productivity, directly affecting food security in Iraq and Syria (Adamo et al.,2020:57-60). Farmers are forced to abandon their lands due to water shortages, leading to displacement and increased rural-to-urban migration (Ozguler & Yildiz,2020:36). Moreover, the decline in fish populations due to altered water regimes has negatively impacted local fisheries, further exacerbating economic hardships (Carkoglu & Eder,2001: 63; Ozguler & Yildiz,2020:31-32). The lack of reliable water access has also heightened competition over remaining resources, contributing to social tensions and, in some cases, violent conflicts over water rights (Mitchell, 2024:1). Iran's involvement is crucial, as the depletion of shared water resources also contributes to growing tensions and cross-border disputes, further destabilizing the region (Zaghiyan et al.,2025:46-49).

Legal and political aspects must also be considered. The lack of binding agreements or transparent cooperation mechanisms for equitable water allocation between these states increases the likelihood of conflicts (Grün, 2024:41-42). Despite numerous negotiations, riparian states continue to disagree on the interpretation and implementation of the no significant harm principle outlined in international legal frameworks. Iraq, Syria, and, more recently, Iran have accused Turkey of disregarding this principle by advancing the GAP project (Asaad,2024:379-380). However, extensive dam construction alone does not necessarily constitute a violation of the principle. While dams can significantly impact downstream water flow, quality, and ecosystems, international water law does not categorically prohibit upstream development. Instead, the principle requires that such activities do not cause significant harm to other riparian states. Applying this principle to the Tigris-Euphrates basin necessitates a comprehensive evaluation of harm, a balance of interests, consultation and cooperation, and thorough environmental and social impact assessments. Notably, the no-harm principle extends to both the quantity and quality of shared water resources (Asaad,2024:380).

Attributing significant harm to upstream activities requires empirical evidence, technical assessments, and data exchange among riparian states. While some argue that upstream countries are responsible for deteriorating

water quality and reduced river flow (Trmosh et al.,2024:31), proving such harm necessitates cooperation and transparent information-sharing (Hasan et al.,2023:783). The integrated modeling approach by (Zaghiyan et al.,2025: 39) reveals that Nash equilibria, although prevalent in most scenarios, do not necessarily result in cooperative outcomes. Instead, riparian states show little motivation to alter their unilateral water development strategies, leading to a non-cooperative equilibrium with no net positive benefit. This aligns with (Zawahri,2008:294) argument that riparian states have historically pursued independent water development without considering their neighbors' concerns, perpetuating conflict and, at times, military tensions. Furthermore, when sustainability is assessed across multiple criteria, cooperative management scenarios yield higher sustainability indicators than unilateral approaches. These findings underscore the urgent need for integrated cooperative water governance.

Our analysis suggests that unless riparian states shift toward a cooperative strategy, the current non-cooperative equilibrium will persist. This highlights the urgency of integrated water diplomacy and revised policy frameworks that balance competing interests while ensuring sustainable water governance. Recent research by (Zaghiyan et al.,2025:23) quantitatively demonstrates how unilateral water development exacerbates transboundary tensions and challenges the no significant harm principle. These findings underscore the need to reassess current water governance strategies to prevent further legal and environmental disputes and facilitate a comprehensive evaluation of how unilateral water development impacts both the basin's hydrological conditions and the transboundary legal responsibilities of riparian states.

Significant harm to any riparian state because of over-exploitation by other states is an undeniable reality. Therefore, in accordance with international agreements between parties, when assessing actions that cause no significant harm, it is essential to consider both the significance of the damage and the factors that contribute to the perception of such damage as significant harm (McIntyre,2020:606-607). The principle of significant harm is intertwined with the principle of equitable and reasonable utilization and have a mutual relationship in a way that the subsequent one cannot be applied with disregard to relevant factors to the latter one (McIntyre,2020:610), besides, in evaluating significant harm to existing wetlands in the area, characteristics of wetlands and the feature of utilization being wise and its relevant factors should be addressed.

Another important point is that the burden of proof in cases of significant harm and resort to the liability of States in this field is quite special, so under general rules, the burden of proof is on the affected State. However, after the claim is established, the claimant is replaced by the defendant, and hereafter, it is on the State of origin to prove its utilization as being equitable and reasonable and could be excluded from liability (Tanzi, 2020: 620-621 & 627). Moreover, in such cases, claimants and defendants may be different according to each case, and the number of defendants can increase or decrease. For instance, in case of significant harm to dam construction, more than the capacity of the Tigris-Euphrates, Iran, Iraq, and Syria can be claimants, as well as in the case of significant harm for the excessive utilization of underground resources in Syria and Turkey, Iran and Iraq may claim for serious damage.

In case of significant harm to wetlands located in the territory of Iran and Iraq (Najafi & Vatanfada, 2013: 151), Iran can be the only claimant that can make a lawsuit against Iraq, Syria, and Turkey due to excessive construction of dams or make independent litigation with a different cause against Iraq, i.e. construction of water deviation canals and drainage of wetlands. Obviously, we are discussing the conditions of lodging a claim or designation of competent court but only we are speaking about significant harm and realization of terms of liability. Claims of significant harm and seriousness of damage, as well as utilization not being equitable and reasonable, are all among substantive issues, and the affected state must present its evidence on these claims and prove them. This is a technical issue rather than a legal one. A distinctive issue in the Tigris-Euphrates basin and the application of equitable and reasonable principle and no significant harm is the doctrine of clean hands of claimant, as well as the concepts of contributory negligence and the act or fault of the affected State. Considering the current situation—marked by reduced water flow in the Tigris-Euphrates basin, the drainage of regional wetlands, and increasing salinity, particularly in the confluence area—almost all riparian states have contributed to these challenges to varying extents. Key contributing factors include the construction of water infrastructure beyond the rivers' capacity, excessive groundwater extraction, and the diversion of water resources through canals (Bachmann et al., 2019: 13; Mahmoodzadeh et al., 2024: 279-281). Our analysis further highlights that these activities have significantly degraded water quality and altered the hydrological balance of the basin. This shared responsibility

complicates the legal attribution of significant harm and emphasizes the necessity for a multilateral cooperative framework.

So, how can a state be considered a purported claimant while having a direct role in harmful implications in the area, and how can riparian states that committed acts of delinquency in the present situation be regarded as claimants? Above all, can a state like Iraq, which itself took measures in constructing various dams and built structures more than the river's catchment, complain an upstream State for such actions? Of course, determining whether constructing a dam with a capacity exceeding the total flow of a river constitutes significant harm requires clear legal and scientific criteria. Key indicators include hydrological modeling, environmental impact assessments, historical flow data, and socio-economic consequences for downstream states. Establishing harm necessitates empirical evidence, technical assessments, and legal scrutiny, making it essential to examine the methodologies used to substantiate claims under international water law.

These issues have been the reasons for the legal and political aspects of the Tigris-Euphrates region getting more complicated, interconnected, and more difficult. Instead of solving this complex issue by referring to international courts and resorting to international rules, we must hope that all riparian states could, by reaching a multilateral and comprehensive agreement with regard to all relevant factors to assessing equitable and reasonable utilization, no significant harm as well as wise use, solve one of the biggest water problems in the world. Scholars who believe in the power of water for peace argue that cooperation and interaction in view of managing basin countries' shared water resources can be strengthened through diplomacy and negotiation and contribute to the establishment of stronger peace and stability (Yeganeh & Bakhshandeh, 2022:335). To achieve this goal, water diplomacy should be employed by the riparian nations as a tool for the settlement of existing or emerging disputes and conflicts ((Kavianirad et al., 2022:90). However, there is no clear future for such a thing.

7. Conclusion

The actions of the riparian States along the Tigris-Euphrates basin, including the construction of dams and structures that exceed the rivers' flow capacity, excessive use of groundwater resources beyond the basin's capacity, and the construction of numerous irrigation canals diverting the rivers' flow towards agricultural lands, have prevented water from reaching the southern wetlands of Iraq. These activities have caused significant damage to the regional

ecosystem and wetlands, leading to increased dust storms in the area. The harm inflicted on any of the riparian States as a result of the actions of the other States is an undeniable reality that must be considered under the principle of not causing significant harm. Furthermore, the principles of equitable and reasonable utilization and not to cause significant harm are closely interrelated. Although they do not conflict at the legislative stage, these two principles come into conflict during implementation; they should be reconciled with the understanding that reasonable use which causes significant harm to another riparian State is prohibited unless the prohibition of such use would cause substantial harm to the utilizing state, in which case the conflict should be resolved in favor of the utilizing State. Although numerous studies have examined the environmental, economic, and agricultural impacts of dam construction in the Tigris-Euphrates basin, our study highlights the relevance of the 'no significant harm' principle in transboundary water governance. By analyzing updated data (1955–2020) in conjunction with legal and policy considerations, our research provides insights into the challenges of implementing this principle in practice, particularly in light of unilateral water development projects and regional power dynamics. The doctrine of contributory negligence, the rules regarding the actions of the injured party, and the doctrine of the claimant's clean hands, which are invoked in establishing the conditions for liability and filing a claim for damages, significantly influence the application of the principle of not to cause significant harm. This is because each of the riparian States of the Tigris-Euphrates basin has, to some extent, committed a fault in their equitable and reasonable utilization, complicating the legal aspects of the basin and making its resolution more challenging. Even assuming the existence of a competent international court, resorting to it and relying on international legal principles may not easily resolve this basin's complex water and environmental issues. This underscores the need for a comprehensive multilateral agreement that considers all factors affecting the evaluation of equitable and reasonable utilization and no significant harm.

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